Revised Recommendations for HIV Screening of Pregnant Women

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Perinatal Counseling and Guidelines Consultation
April 26–27, 1999
Atlanta, Georgia

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Revised Recommendations for HIV Screening of Pregnant Women

Summary

These guidelines replace CDC's 1995 guidelines, U.S. Public Health Service Recommendations for Human Immunodeficiency Virus Counseling and Voluntary Testing for Pregnant Women*, and are for public- and private-sector service providers who provide health care for pregnant women. In 1998, the Institute of Medicine (IOM) published a report that recommended simple, routine, and voluntary human immunodeficiency virus (HIV) testing for all pregnant women in antenatal settings, given the effective interventions available to treat HIV-infected women and reduce risk for perinatal HIV transmission. In 1999, CDC convened consultation groups to discuss and comment on the IOM report. These guidelines are based on input from these meetings, the IOM report, and public comment on draft guidelines published in Fall 2000 in the* Federal Register*. These guidelines were also prompted by scientific and programmatic advances in the prevention of perinatally acquired HIV and care of HIV-infected women. These recommendations are consistent with the* Revised Guidelines for HIV Counseling, Testing, and Referral*.*

Major revisions from the 1995 guidelines include

- *emphasizing HIV testing as a routine part of prenatal care and strengthening the recommendation that all pregnant women be tested for HIV;*
- *recommending simplification of the testing process so that pretest counseling is not a barrier to testing;*
- *making the consent process more flexible to allow for various types of informed consent;*
- *recommending that providers explore and address reasons for refusal of testing; and*
- *emphasizing HIV testing and treatment at the time of labor and delivery for women who have not received prenatal testing and antiretroviral drugs.*

These guidelines recommend voluntary HIV testing to preserve a woman's right to participate in decisions regarding testing to ensure a provider-patient relationship conducive to optimal care for mothers and infants and to support a woman's right to refuse testing if she does not think it is in her best interest.

INTRODUCTION

In 1994, after the announcement of the results of Pediatric AIDS Clinical Trials Group (PACTG) protocol 076 (*1*), the Public Health Service (PHS) published guidelines for zidovudine (ZDV) use to reduce perinatal human immunodeficiency virus (HIV) transmission (*2*). In 1995, PHS issued guidelines recommending universal counseling and voluntary HIV testing of all pregnant women and treatment for those infected (*3*). Publication of these recommendations was followed by rapid implementation by health-care providers, widespread acceptance of chemoprophylaxis by HIV-infected women, and a steep

and sustained decline in perinatal HIV transmission (*4,5*). Observational studies have confirmed the effectiveness of ZDV in reducing the risk for perinatal transmission (*6–8*). This reduction in transmission risk resulted in an 83% decline in perinatal acquired immunodeficiency syndrome (AIDS) cases diagnosed in 1999, compared with the peak incidence of 907 cases in 1992 (*7*).

Despite this progress, children are still being infected perinatally. CDC estimates that 280–370 infants are born with HIV infection each year in the United States (CDC, unpublished data, 2000). These continued infections underscore the need for improved strategies to ensure that all pregnant women are offered HIV testing and, if positive, treatment to reduce their transmission risk and to safeguard their health and the health of their infants.

Several lessons have been learned from evaluation of the 1995 PHS guidelines. Many women, especially those who used illicit drugs, were not tested for HIV during pregnancy because of lack of prenatal care (*8*). In addition, many women refused testing because their health-care providers did not strongly recommend it. Some women declined testing because of perceived low risk, and some providers failed to offer testing because of perceived low risk, perceived difficulties and complexity of required counseling, and misunderstanding of counseling requirements. The logistics of testing, if too complex, also were considered a potential barrier to testing.

In December 1998, the Institute of Medicine (IOM) completed a study commissioned by Congress to assess the impact of current approaches for reducing perinatal HIV transmission, identify barriers to further reductions, and determine ways to overcome these barriers (*9*). IOM concluded that continued perinatal transmission was mainly caused by a lack of awareness of HIV status among some pregnant women. This problem was attributed to some health-care providers not offering HIV testing to all pregnant women because the providers believed they could predict which women were most at risk and that standard HIV testing protocols, particularly the requirement for extensive pretest counseling, were too burdensome to conduct for all women. IOM concluded that HIV testing should be simplified and made routine. They recommended that the United States adopt a national policy of universal HIV testing, with patient notification, as a routine component of prenatal care. That is, testing should be offered to all pregnant women as part of the standard battery of prenatal tests, regardless of risk factors and the prevalence rates in the community. IOM also recommended that women be informed when an HIV test is conducted and of their right to refuse testing.

Since 1994–1995, major scientific advances in the prevention of perinatal transmission and the care of HIV-infected persons have occurred. These advances increased the benefit of knowing one's HIV status, especially during pregnancy. More effective treatment has prolonged survival of HIV-infected persons and improved their quality of life (*10*). Clinical trials proved the effectiveness of prophylactic therapy for preventing perinatal transmission in women who are not treated until the time of delivery (*11*). Studies have indicated that women with nondetectable viral load rarely transmit HIV infection (*12–14*). Finally, new testing technologies (e.g., rapid testing, urine sampling) offer new options for HIV screening.

To address the lessons learned, IOM findings, and scientific advances, as well as the causes of continued HIV infection in children, PHS convened specialists in the field in April 1999 and sought widespread public comment in revising the 1995 guidelines for HIV counseling and testing for pregnant women. Consultation groups included researchers,

professional health-care provider organizations (e.g., American Academy of Pediatrics, American College of Obstetricians and Gynecologists), clinicians, women living with HIV, and representatives from community organizations and PHS agencies overseeing care of HIV-infected pregnant women.

The resulting guidelines are presented in this document. They differ from the 1995 guidelines in that they

- emphasize HIV testing as a routine part of prenatal care and strengthen the recommendation that all pregnant women be tested for HIV,
- recommend simplifying the testing process so that pretest counseling is not a barrier to testing,
- increase the flexibility of the consent process to allow for various types of informed consent,
- recommend that providers explore and address reasons for refusal of testing, and
- emphasize HIV testing and treatment at the time of labor and delivery for women who have not received prenatal testing and chemoprophylaxis.

These guidelines maintain a voluntary approach to HIV testing. This voluntary approach preserves a woman's right to make decisions regarding testing and supports a woman's right to refuse testing if she does not think it is in her best interest.

This document replaces the 1995 PHS guidelines (*3*). These recommendations are primarily intended for providers of health care for women, with a focus on HIV screening of pregnant women to reduce mother-to-child transmission of HIV. This report does not address other concerns related to continued perinatal transmission (e.g., lack of prenatal care). CDC programs targeted to states with the highest incidence of perinatal HIV infection address these ongoing public health problems (information on these programs is available on the Internet at <http://www.cdc.gov/hiv/projects/perinatal/default.htm>). Other PHS guidelines address the importance of prevention interventions, including testing in the general population (see *Revised Guidelines for HIV Counseling, Testing, and Referral*). This report applies only to the United States; different recommendations, especially on breast-feeding, will apply in other countries.

BACKGROUND

HIV Infection and AIDS in Women and Children

Of the approximately 750,000 AIDS cases reported to CDC through the end of 1999, approximately 129,000 were in women. Approximately 64,000 women were living with AIDS in 1999, a 31% increase from 1996, reflecting improved survival with new combination treatment regimens (*15*). However, women with AIDS represent only a fraction of the number of HIV-infected women who need medical and social services. An estimated 120,000–160,000 HIV-infected women reside in the United States, 80% of whom are of childbearing age (*16*).

Most women with HIV/AIDS in the United States reside in the Northeast and the South. The highest numbers of cases were first observed in the Northeast, but the South has reported the greatest increases in recent years. African-American and Hispanic

women are disproportionately affected by the epidemic and account for 80% of AIDS cases reported in U.S. women in 1999. Over time, the proportion of cases in women attributable to injection-drug use has declined, whereas the proportion of cases from heterosexual contact has increased, particularly among young women.

During 1985–1995, approximately 6,000–7,000 HIV-infected women gave birth in the United States each year (*7*). During the early 1990s, before perinatal chemoprophylaxis was available, an estimated 1,000–2,000 infants were born with HIV infection annually. By June 2000, a total of 8,027 perinatally acquired AIDS cases were recorded nationwide, most (85%) in African-American and Hispanic children (*7,15*). Before the results of the PACTG 076 trial using prenatal, intrapartum, and postpartum ZDV for perinatal prophylaxis, the risk for mother-to-child transmission ranged from 16% to 25% in studies from North America and Europe (*17–19*), up to 24% in Thailand (*20*), and 25–40% in Africa (*21,22*). Worldwide, approximately 600,000 infants each year become infected through mother-to-child transmission of the HIV virus.

In the United States, widespread implementation of the PHS guidelines for universal counseling and testing and perinatal use of ZDV has sharply reduced transmission risk and the number of perinatally acquired HIV infections (*7*). By 1995, several cohort studies had documented transmission rates of ≤11% (*19,23*). During 1996–2000, U.S. studies indicated that transmission rates had declined to 5%–6% (*12,24*) and <1% in women with nondetectable plasma viral loads (*12,14,25*). During 2000–2001, perinatal transmission rates of ≤2% have been achieved with combination antenatal antiretroviral drugs (*26*) or with ZDV combined with cesarean section (*27–29*). Analysis of U.S. perinatal AIDS surveillance data (*15*) reported through June 2000 indicated a sharp decline in the number of perinatal AIDS cases; this decline was temporally associated with increasing ZDV use among pregnant women aware of their HIV status (*7*). To more accurately monitor trends in perinatal HIV transmission and the implementation and impact of perinatal prevention programs (including HIV counseling and testing recommendations), CDC, the Council of State and Territorial Epidemiologists (CSTE), and the American Academy of Pediatrics (AAP) recommended national reporting of perinatal HIV exposure and HIV infection to help identify and target populations where prevention opportunities are missed (*30,31*).

Despite the declines, cases of perinatal HIV transmission continue to occur, largely because of missed opportunities for prevention, particularly among women who lack prenatal care or who are not being offered voluntary HIV counseling and testing during pregnancy. The estimated 280–370 infants born with HIV infection each year represent populations in which prevention efforts are impeded by lack of timely HIV testing and treatment of pregnant women (*7*). Of 329 children with perinatally acquired AIDS born during 1995–1996, a total of 112 (34%) were born to mothers not tested for HIV before the child's birth and 67 (20%) to mothers for whom the time of testing was not known.

Dynamics of Perinatal HIV Transmission

Perinatal transmission can occur during pregnancy (intrauterine), during labor and delivery (intrapartum), or after delivery through breast-feeding (postpartum). In the absence of breast-feeding, intrauterine transmission accounts for 25%–40% of infection, and 60%–75% of transmission occurs during labor and delivery (*32*). Among women who breast-feed, approximately 20%–25% of perinatal infections are believed to be

associated with intrauterine transmission, 60%–70% with intrapartum transmission or very early breast-feeding, and 10%–15% with later postpartum transmission through breast-feeding (*33*). In a randomized trial of formula feeding versus breast-feeding, approximately 44% of HIV infection was attributed to breast-feeding (*34*). In breast-feeding populations, a shift toward an increasing proportion of transmission related to breast-feeding is likely to occur as a consequence of successful preventive interventions directed at late prenatal and intrapartum transmission.

Intrapartum transmission can occur during labor through maternal-fetal exchange of blood or during delivery by contact of the infant's skin or mucous membranes with infected blood or other maternal secretions (*32*). Several studies have indicated that most infections transmitted through breast-feeding probably occurred during the first few weeks to months of life (*34–36*). Risk factors during breast-feeding include viral load in breast milk (*37,38*), subclinical or clinical mastitis (*37,39,40*), breast abscesses (*39,40*), and maternal seroconversion during the lactation period (*39,41*).

Several risk factors are associated with perinatal HIV transmission. Clinical factors that increase the likelihood of transmission include immunologically or clinically advanced HIV disease in the mother, high plasma viral load (*12,25,42*), maternal injection-drug use during pregnancy, preterm delivery, nonreceipt of the PACTG 076 regimen, and breast-feeding (*32*). No link has been established between perinatal HIV transmission and maternal age, race/ethnicity, or history of having a previously infected child.

Obstetric factors also influence HIV transmission risk. The risk for perinatal transmission increases per hour duration of membrane rupture after controlling for other risk factors (*43*). Delivery >4 hours after the rupture of the fetal membranes can double the risk for HIV transmission (*19,44*). Maternal infection with another sexually transmitted disease (STD) during pregnancy and certain obstetrical procedures can also increase risk (*45*). Chorioamnionitis (i.e., uterine infection) has been associated with an increased risk for HIV transmission (*23,46*).

Most of these risk factors were identified before the recommended use of ZDV to prevent perinatal HIV transmission. Their effects are unknown now that most pregnant women infected with HIV are receiving ZDV chemoprophylaxis to prevent mother-to-child transmission, as well as combination therapy for their own health. Because of the sharp reductions in perinatal HIV transmission associated with effective antiretroviral interventions, factors that interfere with women or their infants receiving ZDV treatment (e.g., barriers to prenatal care, lack of HIV testing for some pregnant women) are increasingly important (*9*).

Prevention of Perinatal Transmission

The birth of every perinatally HIV-infected infant is a sentinel health event signaling either a missed prevention opportunity or, more rarely, a failure of prophylaxis. An opportunity is missed whenever a woman of childbearing age is unaware of her HIV status or her risk for HIV or when an HIV-infected pregnant woman a) does not receive prenatal care, b) is not offered HIV testing, c) is unable to obtain HIV testing, d) is not offered chemoprophylaxis, e) is unable to obtain chemoprophylaxis, or f) does not complete the chemoprophylaxis regimen. Prophylaxis failures occur when an infant becomes infected despite chemoprophylaxis and other preventive interventions (*9*). Each of these missed opportunities or failures deserves attention from service providers and prevention programs.

Early Prenatal Care

Maximum reduction of perinatal transmission depends on preventing HIV infection in women or identifying HIV infection before pregnancy or as early as possible during pregnancy. Diagnosis allows a woman to receive effective antiretroviral therapies for her own health and preventive drugs (e.g., ZDV) to improve the chances that her infant will be born free of infection. Early knowledge of maternal HIV status is also important for decisions regarding obstetrical management. Achieving these goals requires increased access to and use of prenatal care.

Four states that conducted enhanced HIV surveillance reported that during 1993–1996, approximately 15% of HIV-infected pregnant women in the United States received no prenatal care, compared with only 2% of women in the general population (*5*). HIV-infected women who used illicit drugs during pregnancy were at the highest risk for not receiving prenatal care — 35% compared with 6% for HIV-infected women who were not drug users. During 1997–1998, the HIV transmission rate among women in New York State was 17.5% (30/171) among those with no prenatal care, 16.2% (23/142) among those with 1–2 prenatal visits, and 8.0% (90/1,124) among those with ≥3 prenatal visits, indicating the importance of prenatal care in providing services that prevent perinatal transmission (*47*).

Offer and Acceptance of HIV Testing

Most women who have given birth since the 1995 PHS guidelines have received information or counseling regarding HIV infection and have been offered testing. This has occurred independently of state-to-state variations in application of recommended practices, type of prenatal health-care provider, type of patient insurance, or maternal demographic characteristics (*9*). A 14-state study of HIV counseling and testing data for 1996–1997 reported that the proportion of pregnant women voluntarily tested for HIV was 58%–81% (*30*). Women most likely to receive HIV counseling and testing during pregnancy were those who were African-American, had less than a high school education, were aged <25 years, received care in public rather than private health-care settings, and were Medicaid beneficiaries.

When offered, most women (approximately 70% in most settings) will accept HIV testing. In a multicity study of prenatal clinic patients, 74%–95% of participants accepted HIV testing (*48*). Reasons most commonly cited for acceptance were a) belief that knowledge of positive HIV serostatus during pregnancy (and subsequent chemoprophylaxis) can be beneficial to both mother and infant and b) strong provider endorsement for prenatal HIV testing. The most common reasons for declining the test were no perceived risk, administrative scheduling difficulties, history of previous testing, and lack of provider endorsement.

Although most providers agreed that all women should be tested for HIV, some offered testing only to women whom they considered at risk for infection (*49,50*). Risk-based testing approaches identified fewer HIV-infected women than routine voluntary testing of all pregnant women (*3*) and also decreases in effectiveness as more women are infected through heterosexual contact without knowing their partner's HIV risk status.

Receipt of ZDV Chemoprophylaxis

The primary strategy to prevent perinatal transmission (in addition to avoidance of breast-feeding) is antiretroviral chemoprophylaxis using ZDV, now often part of a combined antiretroviral therapy regimen that reduces viral load as low as possible near the

time of delivery. In the PACTG 076 protocol, chemoprophylaxis consisted of three components: ZDV administered orally to the mother during the second and third trimesters of pregnancy, intravenous administration of ZDV to the mother during labor and delivery, and administration of oral ZDV to the infant during the first 6 weeks of life (*1*).

Data from several sources demonstrated rapid implementation of the recommendations for ZDV prophylaxis by health-care providers and use of ZDV by HIV-infected pregnant women. One study analyzed approximately 6,800 perinatally exposed and infected children born during 1993–1998 in 32 states that reported HIV infection (*51*). Among those whose mothers were tested for HIV before or at birth of the infant, the percentage of infants receiving any component of the recommended ZDV regimen increased from 37% in 1994 to approximately 85% during 1996–1998. In a supplemental study of women diagnosed before delivery in four states, the proportion offered prenatal ZDV increased from 27% in 1993 to 85% in 1996, the proportion offered intrapartum ZDV increased from 5% to 75%, and the proportion offered neonatal ZDV increased from 5% to 76% (*5*). Fewer than 5% of women refused ZDV.

Abbreviated Antiretroviral Regimens

Given the complexity and cost of the PACTG 076 regimen, particularly for the developing world, other effective strategies to reduce the risk for perinatal HIV transmission have been identified. Results of randomized clinical trials in developing countries and observational data from the United States indicated that abbreviated perinatal antiretroviral regimens (*20,52–54*), regimens that begin as late as the onset of labor (*11*), and possibly antiretroviral chemoprophylaxis given only to the newborn (*47*) are effective in reducing the risk for perinatal transmission.

Abbreviated antiretroviral regimens have also proved effective in reducing the risk for transmission in resource-poor countries. In nonbreast-feeding women, a short antepartum/intrapartum regimen of ZDV reduced transmission by 50% (*20*); a similar regimen in breast-feeding populations was also effective, although efficacy was lower (*52–54*). Two other intrapartum/postpartum antiretroviral regimens were effective in reducing transmission in clinical trials among breast-feeding African women. One regimen was nevirapine given as a single dose to the woman in labor and to the infant at age 48 hours, and the other was ZDV plus lamivudine (3TC) given orally intrapartum and to the infant and mother for 1 week postpartum (*11,36,55*). Observational data and animal studies indicated that newborn prophylaxis alone offered some protection (*24,56*). Updated recommendations for use of these regimens in the United States, including for pregnant women who do not receive health care until near the time of delivery are available at the HIV/AIDS Treatment Information Service (ATIS) website at <http://www.hivatis.org> (*57*).

Other Strategies to Prevent Perinatal Transmission

Reducing exposure of the infant to maternal blood and secretions during the intrapartum period can prevent perinatal HIV transmission. Cesarean delivery performed before onset of labor and membrane rupture lowers the risk for HIV transmission compared with vaginal delivery in certain populations of women. Cesarean delivery resulted in a 50% reduction in perinatal HIV transmission overall among HIV-infected women who had cesarean deliveries compared with women delivering vaginally (*28*). A randomized clinical trial in Europe (*27*) demonstrated a benefit of elective cesarean section before onset of labor for both untreated HIV-infected women and infected women on

antiretroviral therapy. However, cesarean delivery is associated with greater morbidity than vaginal delivery among both HIV-infected and noninfected women (*58*). In 1999 and 2000, the American College of Obstetricians and Gynecologists (ACOG) recommended offering scheduled cesarean delivery at 38 weeks gestation to reduce the risk for vertical transmission of HIV infection (*57,59*). Other intrapartum interventions alone (e.g., vaginal disinfection during labor and cleansing of the newborn) have not proven effective (*60*).

Follow-Up Care for Infected Women and Perinatally Exposed Infants

Providing mothers and their infants with ongoing HIV-related care can maximize the benefits of prevention interventions. The medical care of HIV-infected women is a complicated task requiring use of potent combinations of antiretroviral drugs, monitoring of viral load and drug resistance, treatment and prophylaxis of opportunistic infections, and monitoring of immune status. In addition to conditions (e.g., *Pneumocystis carinii* pneumonia [PCP]) for which all immunocompromised HIV-infected persons are at risk, women experience specific manifestations of HIV disease (e.g., aggressive pelvic inflammatory disease and persistent and difficult-to-treat vaginal yeast infections requiring frequent screening and treatment) (*61,62*). HIV-infected women are also at increased risk for cervical dysplasia, which can result in cancer (*63*). With early detection and appropriate treatment, many of these complications can be prevented and treated. Improved health outcomes resulting from advances in HIV management and treatment depend not only on access to medical care but also on access to prevention and psychosocial support services. In the United States, most mothers and children with HIV/AIDS live in areas where poverty, illicit drug use, poor housing, and limited access to and use of medical care and social services add to the challenges of HIV disease (*4,9*). Women with HIV infection often have difficulty gaining access to health care and frequently are responsible for caring for children and other family members who might also be HIV-infected (*64*). They often lack social support and face other challenges that could interfere with their ability to gain access to and adhere to complicated treatment regimens. The complex medical and social problems of families affected by HIV are best managed by multidisciplinary case-management teams that integrate specialty medical care with prevention, psychosocial, and other HIV-related services (see *Revised Guidelines for HIV Counseling, Testing, and Referral*).

Postnatal evaluation of infants at risk for HIV infection that begins immediately after birth is the key to early diagnosis and optimal medical management of infected children. PCP is the most common opportunistic infection in children with AIDS and is often fatal (*65*). Because PCP occurs most often in perinatally infected children at ages 3–6 months (*65*), effective prevention requires that children born to HIV-infected mothers be identified promptly, preferably through maternal testing, so that PCP prophylactic therapy can be initiated at age 6 weeks. In 1995, CDC published revised guidelines recommending PCP prophylaxis for all perinatally exposed infants at ages 4–6 weeks until their infection status was determined (*66*). Perinatal screening can identify HIV-exposed infants early, making it possible to follow infected children closely and promptly diagnose other potentially treatable, HIV-related conditions (e.g., severe bacterial infections). This also allows antiretroviral treatment to be initiated as soon as indicated to prevent morbidity, prolong survival, and reduce the need for hospitalization (*67*).

Follow-up of infants, both infected and uninfected, who are exposed to antiretroviral drugs is critical to identifying potential short- and long-term toxicities. Data on the risks of antiretroviral drugs during pregnancy are summarized and updated regularly (*57*).

Summary of IOM Recommendations

In 1996, Congress charged IOM with evaluating the extent to which state efforts had been effective in reducing perinatal HIV transmission and analyzing barriers to further reduction in such transmission. In 1999, IOM published its results, which addressed ways to increase prenatal testing, improve therapy for HIV-infected women and children, and generally reduce perinatal HIV infections (*9*).

Despite sharp reductions in perinatally transmitted AIDS cases that resulted from widespread implementation of the 1994 and 1995 PHS guidelines, IOM reported that the number of children born with HIV infection exceeded achievable prevention levels. Prenatal HIV testing was not universal, and many HIV-infected women were inadequately treated because they did not seek prenatal care, were not tested for HIV, or received treatment that did not reflect current standards. Even in settings where most prenatal-care providers agreed that HIV tests should be offered to all pregnant women, some reported that they did not offer the test to all women in their practices, mainly because pretest counseling recommended by CDC and promulgated in some state policies were too burdensome (*9*). Citing lack of time and skills for counseling, providers based testing decisions on their own, often inaccurate, assessments of maternal risk.

IOM recommended that the United States adopt a goal that all pregnant women be tested for HIV and all infected women receive optimal treatment for themselves and their children. To help meet this goal, IOM recommended that the United States adopt a policy of universal HIV testing, with patient notification, as a routine component of prenatal care (i.e., all pregnant women should be offered testing regardless of their risk factors or the prevalence rates where they live). Early diagnosis of HIV infection allows pregnant women to receive effective antiretroviral therapy for their own health and reduce the risk for transmitting HIV to their infants. Universal testing avoids stereotyping or stigmatizing any socioeconomic or ethnic group. Women should be told they are being tested for HIV and told of their right to refuse testing. Patient notification allows women to decline testing if they feel it is not in their best interest and simplifies the testing process by eliminating the need for extensive pretest counseling.

Legal Considerations

IOM's recommendations prompted reconsideration of the focus, implementation, and impact of PHS's guidelines for HIV screening of pregnant women. These guidelines recommended counseling all pregnant women regarding the risk for HIV infection, benefits of HIV testing, and voluntary testing. This approach was endorsed by most professional organizations representing prenatal, obstetrical, and perinatal-care providers. States quickly implemented the guidelines, but with substantial variability in strategy (*68*). Most states responded with policies on HIV counseling and testing of pregnant women; approximately 50% also enacted laws or regulations. Most policies and statutes are directed at pregnant women rather than newborns and focus on education, counseling, and consensual testing. New York and Connecticut are the only states that mandate newborn testing. No evidence exists to indicate that any legal approach is more successful than others in preventing perinatal transmission. No states require mandatory testing

of pregnant women. In considering adopting the IOM guidelines, some states have implemented or are considering requiring some form of pretest counseling, routine testing with right of refusal, or universal or selective newborn screening. IOM's recommendation is for universal HIV testing with patient notification. As states consider implementing the IOM recommendations, other important considerations include availability of care and treatment for HIV-infected mothers and their infants, provider training needs, and confidentiality laws to protect positive test results reported to public health surveillance. States should consult with public health officials, health-care providers, and representatives of affected communities during this process.

For the individual woman, the substantial benefits of HIV testing must be weighed against the possible risks. Potential negative consequences of a diagnosis of HIV infection can include loss of confidentiality, job- or health-care–related discrimination and stigmatization, loss of relationships, domestic violence, and adverse psychological reactions (*69*). Providing HIV-infected women with or referring them to psychological, social, and legal services could help minimize these risks and allow more women to benefit from the health advantages of early HIV diagnosis without adverse consequences. The Americans with Disabilities Act (ADA) of 1990 and other federal, state, and local antidiscrimination provisions aim to protect persons with HIV/AIDS against discrimination in the workplace, housing, public services, and public accommodations (*70*). A 1998 U.S. Supreme Court decision provided further antidiscrimination protection by ensuring that persons with asymptomatic HIV disease are included under ADA and have access to nondiscriminatory and effective health care (*70*).

Laboratory Testing Considerations

Testing of women before or during pregnancy is typically conducted according to the standard protocol for detection of antibody to HIV (*71*). For women with unknown HIV status during active labor, antiretroviral treatment can still be effective when given during labor and delivery, followed by treatment of the newborn (*11*). This expedited intervention requires the use of rapid diagnostic testing during labor or rapid return of results from standard testing.

Standard Testing Protocol

The HIV testing algorithm recommended by PHS consists of initial screening with an FDA-licensed enzyme immunoassay (EIA) followed by confirmatory testing of repeatedly reactive EIAs with an FDA-licensed supplemental test (e.g., Western blot). Although each test is highly sensitive and specific, using both increases the accuracy of results.

Indeterminate Western blot results can be caused by either incomplete antibody response to HIV in samples from infected persons or nonspecific reactions in samples from uninfected persons (*72–74*). Incomplete antibody responses that produce negative or indeterminate results on Western blot tests can occur among persons recently infected with HIV who have low levels of detectable antibodies (i.e., seroconversion), persons who have end-stage HIV disease, and perinatally exposed but uninfected infants who are seroreverting (i.e., losing maternal antibody). Nonspecific reactions producing indeterminate results in uninfected persons have occurred more frequently among pregnant or parous women than among other persons (*73,74*). No large-scale studies have been conducted to estimate the prevalence of indeterminate test results in pregnant women. However, a survey of 1,044,944 neonatal dried-blood specimens tested by EIA

for maternally acquired HIV-1 antibody indicated a relatively low rate of indeterminate Western blot results (<1 in 4,000 specimens tested by EIA) (*74*). Overall, 2,845 Western blots were performed.

False-positive Western blot results (especially those with a majority of bands) are rare. For example, in a study that used a sensitive culture technique to test approximately 290,000 blood donors , no false-positive Western blot results were detected (*75*). In a study of the frequency of false-positive diagnoses among military applicants from a low-prevalence population (i.e., <1.5 infections/1,000 population), one false-positive result was detected among 135,187 persons tested (*76*).

An HIV test should be considered positive only after screening and confirmatory tests are reactive. A confirmed positive test result indicates that a person has been infected with HIV. False-positive results when both screening and confirmatory tests are reactive are rare. However, the possibility of a mislabeled sample or laboratory error must be considered, especially for a client with no identifiable risk for HIV infection. HIV vaccine-induced antibodies may be detected by current tests and may cause a false-positive result. Persons whose test results are HIV-positive and who are identified as vaccine trial participants should be encouraged to contact or return to their trial site or an associated trial site for HIV counseling, testing, and referral (CTR) services.

Incorrect HIV test results occur primarily because of specimen-handling errors, laboratory errors, or failure to follow the recommended testing algorithm (*76*). However, patients might report incorrect test results because they misunderstood previous test results or misperceived that they were infected (*77*). Although these occurrences are rare, increased testing of pregnant women will result in additional indeterminate, false-positive, and incorrect results. Because of the significance of an HIV-positive test result, its impact on a woman's reproductive decisions, and the resulting need to consider HIV therapeutic drugs for both a pregnant woman and her infant, previous guidelines have emphasized that HIV test results must be obtained and interpreted correctly. In some circumstances, correct interpretation might require consideration of not only additional testing but also the woman's clinical condition and history of possible exposure to HIV.

Diagnosis of HIV Infection in Newborns

The standard antibody assays used for older children and adults are less useful for diagnosis of infection in children aged <18 months. Nearly all infants born to HIV-infected mothers passively acquire maternal antibody and, in some cases, will test antibody positive until age 18 months regardless of whether they are infected. Definitive diagnosis of HIV infection in early infancy requires other assays, including nucleic acid amplification (e.g., polymerase chain reaction [PCR]) or viral culture. HIV infection is diagnosed by two positive assays (PCR or viral culture) on two separate specimens. Infant HIV testing should be done as soon after birth as possible so appropriate treatment interventions can be implemented quickly (*67*).

Rapid Tests for Expedited Screening

For certain HIV-infected pregnant women, the labor and delivery setting is the first opportunity for HIV testing and interruption of mother-to-child transmission. Although results of conventional EIAs and Western blots are typically not available for 1–2 weeks, rapid tests for detecting antibody to HIV can produce results in 10–60 minutes (*78*). The sensitivity and specificity of rapid assays are comparable with EIAs. However, the predictive value of a single screening test varies with the prevalence of HIV infection among

the population tested. Because HIV prevalence is low in most perinatal testing settings, the negative predictive value of a single rapid test (i.e., the probability that a negative test accurately indicates that the person tested is uninfected) is high. A negative rapid test does not require further testing. In contrast, the positive predictive value of a single test (i.e., the probability that a positive test represents true infection) will be low among populations with low prevalence (*71*). Therefore, a reactive rapid test must be confirmed by a supplemental test (e.g., Western blot). However, necessary peripartum interventions to reduce the risk for perinatal transmission might need to be based on the preliminary results of rapid testing at labor and delivery. Decisions regarding use of antiretroviral drugs to prevent perinatal transmission among women who are repeatedly reactive on a single rapid HIV test require clinical judgment regarding initiation of prophylactic treatment before results of a confirmatory test are available.

Only one FDA-approved rapid HIV test (Abbott Murex Single Use Diagnostic System [SUDS] HIV-1 test, Abbott Laboratories, Inc., Abbott Park, Illinois) is commercially available in the United States, although other rapid tests are being considered for approval. This test can provide definitive negative and preliminary positive test results at the time of testing and identify women who might need antiretroviral treatment and whose infants might benefit from chemoprophylaxis. A careful risk assessment could help make treatment decisions. The predictive value of a reactive rapid test is higher among persons with risk for HIV infection, especially in areas with high HIV prevalence (*79*). Use of a second screening test (either rapid test or EIA) can also improve the positive predictive value of a single reactive rapid HIV test. In studies conducted outside the United States, specific combinations of $\geq$2 different screening assays provided results as reliable as those from the conventional EIA/Western blot combination (*80*).

Expedited EIA testing that produces results within a few hours can also aid decisions regarding antiretroviral therapy. Although results from standard testing are not likely to be available during labor and delivery, they could be available within 12 hours of an infant's birth. Because neonatal prophylaxis might be effective in reducing risk for transmission (*24*), expedited application of the standard testing protocol is another way to reduce mother-to-child infection.

Research and programmatic studies are underway to assess the feasibility of offering voluntary HIV counseling and rapid testing at labor and delivery to women of unknown serostatus in the United States. Implementation of rapid testing and expedited EIA approaches should address several ethical and logistical considerations, including

- acceptability of rapid HIV testing in the labor room,
- difficulty in obtaining informed consent for testing and treatment during labor or soon after birth,
- acceptance of intrapartum and postpartum ZDV prophylaxis for the mother or infant,
- optimal timing of posttest counseling,
- logistical concerns for providers,
- implications of preliminary reactive test results, and
- comprehension of discussions regarding antiretroviral treatment by women who are in labor (*81,82*).

A CDC-funded, multicenter initiative called Mother-Infant Rapid Intervention at Delivery (MIRIAD) is underway to address these considerations among women with inadequate prenatal care in communities with high HIV seroprevalence among women of childbearing age (*81*). If successful, this initiative will offer crucial peripartum interventions to reduce the risk for HIV transmission among HIV-infected women first identified at labor and delivery.

RECOMMENDATIONS

The following revised recommendations for HIV screening of pregnant women are based on scientific and clinical advances in preventing perinatally acquired HIV and caring for HIV-infected women, recommendations from IOM, consultations with specialists in the field, and public opinion. They reflect the need for universal HIV testing of all pregnant women and simplification of the pretest process so that operational procedures do not impede women from benefitting from proven measures to prevent perinatal transmission and from other advances in the care and treatment of HIV disease. Although universal testing is recommended, testing should remain a voluntary decision by the pregnant woman.

Screening for HIV in Pregnant Women and Their Infants

- PHS recommends that all pregnant women in the United States be tested for HIV infection. All health-care providers should recommend HIV testing to all of their pregnant patients, pointing out the substantial benefit of knowledge of HIV status for the health of women and their infants. HIV screening should be a routine part of prenatal care for all women.
- HIV testing should be voluntary and free of coercion. Informed consent before HIV testing is essential. Information regarding consent can be presented orally or in writing and should use language the client understands. Accepting or refusing testing must not have detrimental consequences to the quality of prenatal care offered. Documentation of informed consent should be in writing, preferably with the client's signature. State or local laws and regulations governing HIV testing should be followed. HIV testing should be presented universally as part of routine services to pregnant women, and confidential informed consent should be maintained (see *Revised Guidelines for HIV Counseling, Testing, and Referral*).
- Although HIV testing is recommended, women should be allowed to refuse testing. Women should not be tested without their knowledge. Women who refuse testing should not be coerced into testing, denied care for themselves or their infants, or threatened with loss of custody of their infants or other negative consequences. Discussing and addressing reasons for refusal (e.g., lack of awareness of risk or fear of the disease, partner violence, potential stigma, or discrimination) could promote health education and trust-building and allow some women to accept testing at a later date. Women who refuse testing because of a previous history of a negative HIV test should be informed of the importance of retesting during pregnancy. All logistical reasons for not testing (e.g., scheduling) should be addressed as well. Health-care providers should remember that some women

who initially refuse testing might accept at a later date, particularly if their concerns are discussed. Some women who refuse confidential testing might be willing to obtain anonymous testing. However, they should be informed that if they choose anonymous testing, no documentation of the results will be recorded in the medical chart, and their providers might have to retest them, potentially delaying provision of antiretoviral drugs for therapy or perinatal prophylaxis. Some women will continue to refuse testing, and their decisions should be respected.

- Before HIV testing, health-care providers should provide the following minimum information. Although a face-to-face counseling session is ideal, other methods can be used (e.g., brochure, pamphlet, or video) if they are culturally and linguistically appropriate.
  - — HIV is the virus that causes AIDS. HIV is spread through unprotected sexual contact and injection-drug use. Approximately 25% of HIV-infected pregnant women who are not treated during pregnancy can transmit HIV to their infants during pregnancy, during labor and delivery, or through breast-feeding.
  - — A woman might be at risk for HIV infection and not know it, even if she has had only one sex partner.
  - — Effective interventions (e.g., highly active combination antiretrovirals) for HIV-infected pregnant women can protect their infants from acquiring HIV and can prolong the survival and improve the health of these mothers and their children.
  - — For these reasons, HIV testing is recommended for all pregnant women.
  - — Services are available to help women reduce their risk for HIV and to provide medical care and other assistance to those who are infected.
  - — Women who decline testing will not be denied care for themselves or their infants.
- Health-care providers should perform HIV testing in consenting women as early as possible during pregnancy to promote informed and timely therapeutic decisions. Retesting in the third trimester, preferably before 36 weeks of gestation, is recommended for women known to be at high risk for acquiring HIV (e.g., those who have a history of sexually transmitted diseases [STDs], who exchange sex for money or drugs, who have multiple sex partners during pregnancy, who use illicit drugs, who have sex partner[s] known to be HIV-positive or at high risk, and who have signs and symptoms of seroconversion). Routine universal retesting in the third trimester may be considered in health-care facilities with high HIV seroprevalence among women of childbearing age. Retesting for syphilis during the third trimester and again at delivery also is recommended for pregnant women at high risk (*83*). Some states mandate syphilis screening at delivery for all pregnant women.
- Women admitted for labor and delivery with unknown or undocumented HIV status should be assessed promptly for HIV infection to allow for timely prophylactic treatment. Expedited testing by either rapid return of results from standard testing

or use of rapid testing (with confirmation by a second licensed test when available) is recommended for these women. The goal is to identify HIV-infected women or their infants as soon as possible because the efficacy of prophylactic therapy is greatest if given during or as soon after exposure as possible (i.e., within 12 hours of birth). Informed consent is essential for women tested prenatally, and women in labor with unknown status should be allowed to refuse testing without undue consequences. After delivery, standard confirmatory testing should be done for women with positive rapid test results.

- Some women might not a) receive testing during labor and delivery, b) choose to be tested for HIV, or c) retain custody of their infants. If the mother has not been tested for HIV, she should be informed that knowing her infant's infection status has benefits for the infant's health and that HIV testing is recommended for her infant. Providers should ensure that the mother understands that a positive HIV antibody test for her infant indicates infection in herself. For infants whose HIV infection status is unknown and who are in foster care, the person legally authorized to provide consent should be informed that HIV testing is recommended for infants whose biological mothers have not been tested. Testing should be performed in accordance with the policies of the organization legally responsible for the child and with prevailing legal requirements for HIV testing of children.
- Regulations, laws, and policies regarding HIV screening of pregnant women and infants are not standardized throughout all states and U.S. territories. Health-care providers should be familiar with and adhere to state/local laws, regulations, and policies concerning HIV screening of pregnant women and infants.

Education and Prevention Counseling of Pregnant Women Regarding HIV

When the pretest process is simplified to providing essential information, the value of prevention counseling should not be lost. For some women, the prenatal care period could be an ideal opportunity for HIV prevention and subsequent behavior change to reduce risk for acquiring HIV infection. Thus, the following steps are recommended:

- Information regarding HIV and assessment of risks for HIV infection (i.e., risk screening) should be provided to all pregnant women as part of routine health education. Reluctance to provide HIV prevention counseling should never be a barrier to HIV testing. Similarly, a focus on increased HIV testing should not be a barrier to providing effective HIV prevention counseling for persons determined to be at increased risk for acquiring or transmitting HIV (see *Revised Guidelines for HIV Counseling, Testing, and Referral*).
- Pregnant women found to have behaviors that place them at high risk for acquiring HIV infection (e.g., multiple sex partners, current diagnosis or history of STDs, exchange of sex for money or drugs, substance abuse) or who want more intensive client-centered HIV prevention counseling should be provided with or referred to HIV risk-reduction services (e.g., drug treatment, STD treatment, HIV centers with personnel trained in HIV counseling).

Interpretation of HIV Test Results

- HIV antibody testing should be performed according to the recommended algorithm, which includes an EIA to test for antibody to HIV and confirmatory testing with a more specific assay (e.g., Western blot). All assays should be performed according to manufacturers' instructions and state and federal laboratory guidelines.
- HIV infection (as indicated by the presence of antibody to HIV) is defined as a repeatedly reactive EIA and a positive confirmatory supplemental test. Confirmation or exclusion of HIV infection in a person with indeterminate test results should be based on HIV antibody test results, consideration of the person's medical and behavioral history, results from additional virologic and immunologic tests when performed, and clinical follow-up (see *Revised Guidelines for HIV Counseling, Testing, and Referral*). Whenever possible, uncertainties regarding HIV infection status, including laboratory test results, should be resolved before final decisions are made regarding reproductive options, antiretroviral therapy, cesarean delivery, or other interventions.
- Pregnant women who have repeatedly reactive EIAs and indeterminate supplemental tests should be retested for HIV antibody to distinguish between recent seroconversion and a negative test result. Almost all nonpregnant HIV-infected persons with indeterminate Western Blot will develop detectable HIV antibody within 1 month of exposure to the virus; relevant data are not available for pregnant women. Although viral DNA/RNA assays can be helpful, they are not FDA-approved for diagnostic use.
- Women who have negative EIA or rapid test results and those who have repeatedly reactive EIAs but negative supplemental tests should be considered uninfected unless they have had a recent HIV exposure. A negative test result provides information regarding the woman's status, but does not ensure that a sexual or needle-sharing partner is uninfected.
- As additional rapid assays become licensed and available in the United States, specific combinations of $\geq$2 different rapid HIV tests for diagnosis of HIV infection in women who do not receive health care until labor might be useful because combinations of rapid tests have provided results as reliable as those from the EIA/Western blot combination (*78*). Until other rapid assays are available, some women who are reactive on a single rapid test might consider prophylactic treatment until HIV infection is ruled out. Confirmatory standard testing should be done after delivery for women with a positive rapid test result.

Recommendations for HIV-Infected Pregnant Women

- HIV-infected pregnant women should receive HIV prevention counseling as recommended (see *Revised Guidelines for HIV Counseling, Testing, and Referral*). This counseling should include discussion of the risk for perinatal HIV transmission, ways to reduce this risk, and the prognosis for infants who become infected. HIV-infected pregnant women should also be told the clinical implications of a

positive HIV antibody test result and the need for and benefit of HIV-related medical and other early intervention services, including how to access these services.

- HIV-infected pregnant women should be counseled regarding antiretroviral therapy during pregnancy to improve their health (*84*) and prevent perinatal transmission (*57*). Medical care and management of HIV-infected persons, especially pregnant women, can be complicated because of the need for combination therapy with multiple drugs, management of common side effects, careful monitoring of viral load and drug resistance, prophylaxis for and treatment of opportunistic infections, and monitoring of immune status. Health-care providers who are not experienced in the care of pregnant HIV-infected women are encouraged to obtain referral for specialty care from providers who are knowledgeable in this area.

Although pregnancy is not an adequate reason to defer therapy for HIV infection, unique considerations exist regarding use of antiretroviral drugs during pregnancy, including the potential need to alter dosing because of physiologic changes associated with pregnancy, the potential for adverse short- or long-term effects on the fetus and infant, and the effectiveness in reducing the risk for perinatal transmission (*57*).

- Obstetric providers should adhere to best obstetric practices, including offering scheduled cesarean section at 38 weeks to reduce risk for perinatal HIV transmission (*60,85*).

- HIV-infected pregnant women should receive information regarding all reproductive options. Reproductive counseling should be nondirective. Health-care providers should be aware of the complex concerns that HIV-infected women must consider when making decisions regarding their reproductive options and should be supportive of any decision.

- To eliminate the risk for postnatal transmission, HIV-infected women in the United States should not breast-feed. Support services for use of appropriate breast milk substitutes should be provided when necessary. UNAIDS and World Health Organization recommendations for HIV and breast-feeding should be followed in international settings (*86*).

- To optimize medical management, positive and negative HIV test results should be available to a woman's health-care provider and included on her confidential medical records and those of her infant. After informing the mother, maternal health-care providers should notify the pediatric-care providers of the impending birth of an HIV-exposed infant and any anticipated complications. If HIV is first diagnosed in the infant, health-care providers should discuss the implications for the mother's health and help her obtain care. Women should also be encouraged to have their other children tested for HIV. Children can be infected with HIV for many years before complications occur. Providers are encouraged to build supportive health-care relationships that promote discussion of pertinent health information. Confidential HIV-related information should be disclosed or shared only in accordance with prevailing legal requirements.

- After receiving their test results, HIV-infected pregnant women should receive counseling, including assessment of the potential for negative effects (e.g., discrimination, domestic violence, psychological difficulties). Counseling should also include information on how to minimize these consequences, assistance in identifying supportive persons in their own social networks, and referral to appropriate psychological, social, and legal services. HIV-infected women should be counseled regarding the risk for transmission to others and ways to decrease this risk. They also should be told that discrimination based on HIV status or AIDS in housing, employment, state programs, and public accommodations (including physicians' offices and hospitals) is illegal.
- Health-care providers should thoroughly assess the prevention service needs of HIV-infected women (e.g., substance abuse, STD treatment, partner referral, or family planning services) and develop a plan to promote access to and use of these services (see *Revised Guidelines for HIV Counseling, Testing, and Referral*).
- Health-care providers should follow the Public Health Service Task Force recommendations for using antiretroviral drugs to treat pregnant HIV-1 infected women and reduce perinatal HIV-1 transmission in the United States, which address treating pregnant women who do not receive health care until near the time of delivery. These recommendations are available at the HIV/AIDS Treatment Information Service (ATIS) website at <http://www.hivatis.org> (*57*).

Recommendations for Postpartum Follow-Up of Infected Women and Perinatally Exposed Children

- HIV-infected women should receive ongoing HIV-related medical care, including immune-function monitoring, recommended therapy, and prophylaxis for and treatment of opportunistic infections and other HIV-related conditions (*84,87*). HIV-infected women should receive gynecologic care, including regular Pap smears, reproductive counseling, information on how to prevent sexual and drug-related transmission of HIV, and treatment of gynecologic conditions according to published recommendations (*87*). Obstetrical providers should ensure that HIV-infected women are introduced or referred to another provider to continue their care after pregnancy.
- HIV-infected women (or their children's guardians) should be informed of the importance of follow-up for their children. Children whose HIV infection status is unknown require early diagnostic testing and prophylactic therapy to prevent PCP pending determination of their status.
  - — Infected children require follow-up care to determine the need for prophylactic therapy and antiretroviral treatment and to monitor disorders in growth and development that often occur before age 24 months.
  - — Uninfected children who are exposed to antiretroviral therapy should be assessed for potential short- and long-term side effects.
- Identification of an HIV-infected mother indicates that her family needs or will need medical and social services as her disease progresses. Thus, health-care providers should ensure that referrals to services address the needs of the entire family.

CONCLUSION

Because of recent advances in both antiretroviral and obstetrical interventions, pregnant women infected with HIV who know their status prenatally can reduce their risk for transmitting HIV to their infants to ≤2%. The guidelines in this report are intended to reduce barriers to voluntary HIV testing for all pregnant women in the United States and to make the voluntary counseling and testing process simple and routine in prenatal settings. The recommendations underscore the importance of HIV-infected pregnant women (and their health-care providers) knowing their status to protect their own health and reduce the risk for transmitting HIV to their infants.

Acknowledgments

We are grateful for the contributions of Ida Onorato, M.D., CDC.

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MMWR
MORBIDITY AND MORTALITY
WEEKLY REPORT

November 9, 2001 / Vol. 50 / No. RR-19a2

Recommendations and Reports

Continuing Education Activity Sponsored by CDC

Revised Recommendations for HIV Screening for Pregnant Women

EXPIRATION — November 9, 2004

You must complete and return the response form electronically or by mail by **November 9, 2004,** to receive continuing education credit. If you answer all of the questions, you will receive an award letter for 1.5 hours Continuing Medical Education (CME) credit, 0.1 hour Continuing Education Units (CEUs), or 1.7 hours Continuing Nursing Education (CNE) credit. If you return the form electronically, you will receive educational credit immediately. If you mail the form, you will receive educational credit in approximately 30 days. No fees are charged for participating in this continuing education activity.

INSTRUCTIONS

By Internet

1. Read this *MMWR* (Vol. 50, RR-19, *Revised Recommendations for HIV Screening for Pregnant Women*), which contains the correct answers to the questions beginning on the next page.
2. Go to the *MMWR* Continuing Education Internet site at <http://www.cdc.gov/mmwr/cme/conted.html>.
3. Select which exam you want to take and select whether you want to register for CME, CEU, or CNE credit.
4. Fill out and submit the registration form.
5. Select exam questions. To receive continuing education credit, you must answer all of the questions. Questions with more than one correct answer will instruct you to "Indicate all that apply."
6. Submit your answers no later than **Novemeber 9, 2004**.
7. Immediately print your Certificate of Completion for your records.

By Mail or Fax

1. Read this *MMWR* (Vol. 50, RR-19, *Revised Recommendations for HIV Screening for Pregnant Women*), which contains the correct answers to the questions beginning on the next page.
2. Complete all registration information on the response form, including your name, mailing address, phone number, and e-mail address, if available.
3. Indicate whether you are registering for CME, CEU, or CNE credit.
4. Select your answers to the questions, and mark the corresponding letters on the response form. To receive continuing education credit, you must answer all of the questions. Questions with more than one correct answer will instruct you to "Indicate all that apply."
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Continuing Medical Education (CME). CDC is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians. CDC designates this educational activity for a maximum of 1.5 hours in category 1 credit toward the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.

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Continuing Nursing Education (CNE). This activity for 1.7 contact hours is provided by CDC, which is accredited as a provider of continuing education in nursing by the American Nurses Credentialing Center's Commission on Accreditation.

GOAL AND OBJECTIVES

This *MMWR* provides recommendations regarding the screening of pregnant women for human immunodeficiency virus (HIV) infection. These recommendations were prepared by the U.S. Public Health Service based on public health and obstetric practice guidelines and input from a panel of specialists. The goal of this report is to provide guidance to public- and private-sector policy makers and clinical providers on HIV screening during pregnancy. Upon completion of this continuing education activity, the reader should be able to a) describe the recommended HIV counseling and testing strategy for pregnant women, b) identify risk factors for perinatal HIV transmission, c) identify barriers to HIV testing among pregnant women, and d) describe the information that pregnant women should receive before HIV testing.

To receive continuing education credit, please answer all of the following questions.

1. The recommended testing strategy for pregnant women can best be described as

A. universal counseling and voluntary HIV testing.
B. routine counseling and targeted testing.
C. voluntary counseling and testing.
D. targeted counseling and testing.

2. The new guidelines differ from the 1995 guidelines for HIV counseling and testing for pregnant women in all of the following ways except

A. making the consent process more flexible.
B. strengthening the recommendation that all pregnant women be tested for HIV.
C. placing more emphasis on HIV testing and treatment at the time of delivery.
D. recommending simplification of the testing process.
E. none of the above.

3. All of the following factors have been associated with increased risk for perinatal HIV transmission except

A. advanced maternal HIV disease.
B. prolonged rupture of membranes.
C. scheduled cesarean delivery.
D. preterm delivery.
E. maternal infection with another sexually transmitted disease (STD).

4. All of the following are reasons commonly cited by women for declining HIV testing except

A. no perceived risk.
B. financial constraints.
C. administrative scheduling difficulties.
D. lack of provider endorsement.
E. history of previous testing.

5. Which of the following are included as one of the components of the recommended Pediatric AIDS Clinical Trials Group protocol 076 regimen for administration of zidovudine (ZDV)?

A. Administration of oral ZDV to the infant for the first 8 weeks of life.
B. Administration of oral ZDV to the mother beginning during the first trimester.
C. Administration of intravenous ZDV to the infant at time of birth.
D. Administration of intravenous ZDV during labor and delivery.

6. All of the following information should be provided to pregnant women before HIV testing except

A. Effective interventions can help protect infants from becoming infected.
B. Services are available to help women reduce their risk for HIV.
C. A woman might be at risk for HIV and not know it.
D. Repeat HIV testing is not recommended for women tested within the year.
E. HIV can be transmitted through breast-feeding.

7. Retesting for HIV in the third trimester is recommended for

A. women with a history of STDs.
B. women with multiple sex partners during pregnancy.
C. A and B.
D. none of the above.

8. Informed consent before HIV testing is

A. optional.
B. mandated by federal law.
C. essential.
D. required by most states.

9. Indicate your work setting.

A. State/local health department.
B. Other public health setting.
C. Hospital clinic/private practice.
D. Managed care organizations.
E. Academic institution.
F. Other.

10. Which best describes your professional activities?

A. Patient care — emergency/urgent care department.
B. Patient care — inpatient.
C. Patient care — primary-care clinic or office.
D. Laboratory/pharmacy.
E. Public health.
F. Other.

11. I plan to use these recommendations as the basis for . . . (*Indicate all that apply.*)

A. health education materials.
B. insurance reimbursement policies.
C. local practice guidelines.
D. public policy.
E. other.

12. Each month, approximately how many pregnant patients/clients do you see?

A. None.
B. 1–10.
C. 11–30.
D. 30–50.
E. >50.

13. How much time did you spend reading this report and completing the exam?

A. Fewer than 1.5 hours.
B. More than 1.5 hours but fewer than 2 hours.
C. 1–1.5 hours.
D. More than 2.5 hours but fewer than 3 hours.
E. 3 hours or more.

14. After reading this report, I am confident I can describe the recommended HIV counseling and testing strategy for pregnant women.

A. Strongly agree.
B. Agree.
C. Neither agree nor disagree.
D. Disagree.
E. Strongly disagree.

15. After reading this report, I am confident I can identify risk factors for perinatal HIV transmission.

A. Strongly agree.
B. Agree.
C. Neither agree nor disagree.
D. Disagree.
E. Strongly disagree.

16. After reading this report, I am confident I can identify barriers to HIV testing among pregnant women.

A. Strongly agree.
B. Agree.
C. Neither agree nor disagree.
D. Disagree.
E. Strongly disagree.

17. After reading this report, I am confident I can describe the information that pregnant women should receive before HIV testing.

A. Strongly agree.
B. Agree.
C. Neither agree nor disagree.
D. Disagree.
E. Strongly disagree.

18. The objectives are relevant to the goal of this report.

A. Strongly agree.
B. Agree.
C. Neither agree nor disagree.
D. Disagree.
E. Strongly disagree.

19. Overall, the presentation of the report enhanced my ability to understand the material.

A. Strongly agree.
B. Agree.
C. Neither agree nor disagree.
D. Disagree.
E. Strongly disagree.

20. The recommendations will affect my practice.

A. Strongly agree.
B. Agree.
C. Neither agree nor disagree.
D. Disagree.
E. Strongly disagree.

21. How did you learn about this continuing education activity?

A. Internet.
B. Advertisement (e.g., fact sheet, *MMWR* cover, newsletter, or journal).
C. Coworker/supervisor.
D. Conference presentation.
E. *MMWR* subscription.
F. Other.

Correct answers for questions 1–8

1. A; 2. E; 3. C; 4. B; 5. D; 6. D; 7. C; 8. C.

MMWR Response Form for Continuing Education Credit
November 9, 2001/Vol. 50/No. RR-19a2

Revised Recommendations for HIV Screening for Pregnant Women

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1. provide your contact information;
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Fill in the appropriate blocks to indicate your answers. Remember, you must answer <u>all</u> of the questions to receive continuing education credit!

1. [ ] A [ ] B [ ] C [ ] D
2. [ ] A [ ] B [ ] C [ ] D [ ] E
3. [ ] A [ ] B [ ] C [ ] D [ ] E
4. [ ] A [ ] B [ ] C [ ] D [ ] E
5. [ ] A [ ] B [ ] C [ ] D
6. [ ] A [ ] B [ ] C [ ] D [ ] E
7. [ ] A [ ] B [ ] C [ ] D
8. [ ] A [ ] B [ ] C [ ] D
9. [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F
10. [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F
11. [ ] A [ ] B [ ] C [ ] D [ ] E
12. [ ] A [ ] B [ ] C [ ] D [ ] E
13. [ ] A [ ] B [ ] C [ ] D [ ] E
14. [ ] A [ ] B [ ] C [ ] D [ ] E
15. [ ] A [ ] B [ ] C [ ] D [ ] E
16. [ ] A [ ] B [ ] C [ ] D [ ] E
17. [ ] A [ ] B [ ] C [ ] D [ ] E
18. [ ] A [ ] B [ ] C [ ] D [ ] E
19. [ ] A [ ] B [ ] C [ ] D [ ] E
20. [ ] A [ ] B [ ] C [ ] D [ ] E
21. [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F

Signature ***Date I Completed Exam***

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MMWR

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